DRT710M

Three phase DIN rail power quality meter with multi-tariff

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User manual

1.1 Safety instructions

Information for Your Own Safety
This manual does not contain all of the safety measures operating the equipment (module, device) for different conditions and requirements. However, it does contain information which you must know for your own safety and to avoid damages. These information are highlighted by a warning triangle indicating the degree of potential danger.

Warning
This means that failure to observe the instruction can result in death, serious injury or considerable material damage.

Caution
This means hazard of electric shock and failure to take the necessary safety precautions will result in death, serious injury or considerable material damage.

Qualified personnel
Operation of the equipment (module, device) described in this manual may only be performed by qualified personnel. Qualified personnel in this manual means person who are authorized to commission, start up, ground and label devices, systems and circuits according to safety and Regulatory standards.

Use for the intended purpose
The equipment (device, module) may only be used for the application specified in the catalogue and the user manual, and only be connected with devices and components recommended and approved by B+G E-TECH.

Proper handling
The prerequisites for perfect, reliable operation of the product are proper transport, proper storage, installation and proper operation and maintenance. When operating electrical equipment, parts of this equipment automatically carry dangerous voltages. Improper handling can therefore result in serious injuries or material damage.

- ✧ Use only isolating tools.
- ✧ Do not connect while circuit is live (hot).
- ✧ Place the meter only in dry surroundings.
- ✧ Do not mount the meter in an explosive area or expose the meter to dust, mildew and insects.
- ✧ Make sure the wires are suitable for the maximum current of this meter.
- ✧ Make sure the AC wires are connected correctly before activating the current/voltage to the meter.
- ✧ Do not touch the meter connecting clamps directly with metal, blank wire and your bare hands as you may get electrical shock.
- ✧ Make sure the protection cover is placed after installation.
- ✧ Installation, maintenance and reparation should only be done by qualified personnel.
- ✧ Never break the seals and open the front cover as this might influence the function of the meter, and will cause no warranty.
- ✧ Do not drop, or allow strong physical impact on the meter as the high precisely components inside may be damaged.

Disclaimer
We have checked the contents of this publication and every effort has been made to ensure that the descriptions are as accurate as possible.

However, deviations from the description cannot be completely ruled out, so that no liability can be accepted for any errors contained in the information given. The data in this manual is checked regularly and the necessary corrections are included in subsequent editions. We are grateful for any improvements that you suggest.

Subject to technical modifications without notice.

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1.2 Foreword

Thank you for purchasing the B+G E-Tech DRT710M DIN rail three phase power quality meter with multi-tariff function. Output is LCD displayed and the data can be transported by isolated RS485 . The meter is provided with a non-volatile memory system that ensures that the readings are not lost or altered when power off.

The B+G E-Tech DRT710M power quality meter is the most advanced type electronic meter available at the market. With the B+G E-TECH product range we have introduced a large scale of energy meters on the market suitable for 110V AC to 400V AC (50 or 60Hz). Besides the normal energy meters we also developed our own pre-paid meters with chip card, chip card re-loaders and a complete PC management control system. For more information on other product please contact our sales department at steven@B+G E-Techgroup.com

Although we produce the B+G E-TECH DRT710M meter according to IEC 62053-21, EN50160 and our quality inspection is very accurate there might always be a possibility that your product shows a fault or failure for which we do apologize. Under normal conditions your product should give you years of benefit and pleasure. In case there is a problem with the energy meter you should contact your dealer immediately. All energy meters are sealed with a special seal. Once this seal is broken there is no possibility to claim for warranty. Therefore NEVER open an meter or break the seal of the meter. The warranty time is 12 months, after installation, and only valid for construction faults.

1.3 Performance criteria:

Operating humidity	≤ 75%
Storage humidity	≤ 95%
Operating temperature	-10°C - +50°C
Storage temperature	-30°C - +70°C
International standard	IEC 62053-21
Accuracy class	
Voltage, LN & LL (Phase1,2,3)	±1%
Amps (Phase 1,2,3)	±0.5%
PF (Phase 1,2,3 &Σ)	±0.5%
Active power (Phase 1,2,3&Σ)	±1%
Reactive power (Phase 1,2,3&Σ)	±1%
Apparent power (Phase 1,2,3&Σ)	±1%
Frequency	±0.5%
Active energy& Demand (Σ)	±1%
Protection against penetration of dust and water	IP51
Insulating encased meter of protective class	II

1.4 Meter specifications:

Meter type	DRT710M (LCD display)
Nominal voltage (Un)	230/400V AC (3~) ; 110/190V AC (3~)
Operational voltage	161/279 – 300/520V AC (3~) ; 77/133 – 143/247V AC
Insulation capabilities:	
- AC voltage withstand	2KV for 1 minute
- Impulse voltage withstand	6KV – 1.2μS waveform
Basic current (Ib):	
CT type	1.5A
Directly connect	10A
Maximum rated current (Imax)	
CT type	6A
Directly connect	100A
Operational current range	0.4% Ib- Imax
Over current withstand	30Imax for 0.01s
Operational frequency range	50Hz ±10%
Internal power consumption	≤2W / 10VA per phase
Test output flash rate (PULSE LED)	
CT	3200imp/kWh
Directly connect	400imp/kWh
Test pulse output rate (pins 8 & 9)	
CT type	3200imp/kWh
Directly connect	400imp/kWh
Consumption indicator (PULSE & SO LED)	Flashing at load running
Communication indicator	Flashing at communication running
Alarm indicator	
Data communication port	RS485 and far infrared
Data save	The data can be stored more than 20 years when power off

1.5 RS485 communication specifications:

Bus type	RS485
Protocol	MODBUS RTU with 16 bit CRC & DL/T645
baud rate	1200, 2400,4800,9600
Address range	0-255 user settable
Bus Loading	64 meters per bus
Rage	1000m

1.6 Far Infrared communication specifications:

infrared wavelengths	900- 1000nm
baud rate	1200bps(default),9600bps(option)
communication distance	5m
communication angle	-15°~+15°
protocol	MODBUS RTU with 16 bit CRC & DL/T645

1.7 Tariff specifications:

Tariff number	4
Time segments	10
Clock accuracy	≤0.5S (every 24 hours)
Battery Voltage	3.6V DC, ≥1.2Ah

1.8 Basic errors:

With balanced loads

0.05Ib	Cosϕ = 1	±1.5%
0.1Ib	Cosϕ = 0.5L	±1.5%
	Cosϕ = 0.8C	±1.5%
0.1Ib - Imax	Cosϕ = 1	±1.0%
0.2Ib - Imax	Cosϕ = 0.5L	±1.0%
	Cosϕ = 0.8C	±1.0%

With single phase load

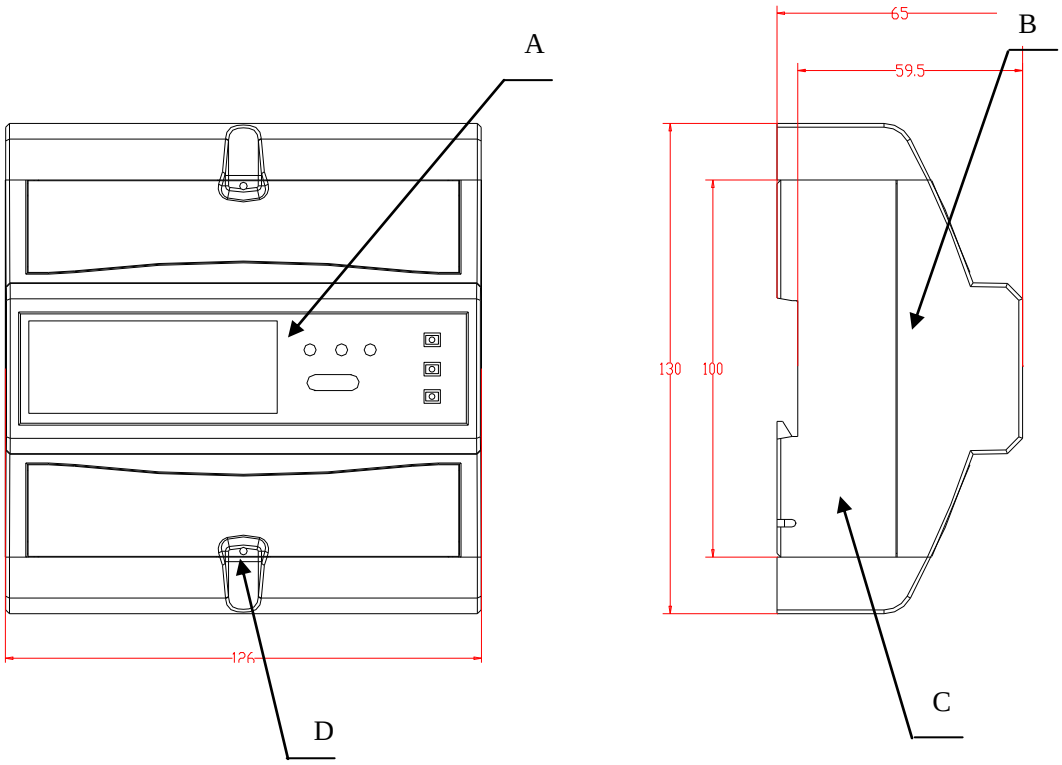
0.1Ib - Imax	Cosϕ = 1	±2.0%
0.2Ib - Imax	Cosϕ = 0.5L	±2.0%

1.8 Description

A	Front panel
B	Cover
C	Base
D	Security hasp

Material

Front panel	PC inflammable retarding
Cover	ABS inflammable retarding
Base	ABS inflammable retarding



1.9 Dimensions

Height	130 mm
Width	126 mm
Depth	65 mm
Weight	0.7 Kg (net)

1.10 Installation

CAUTION

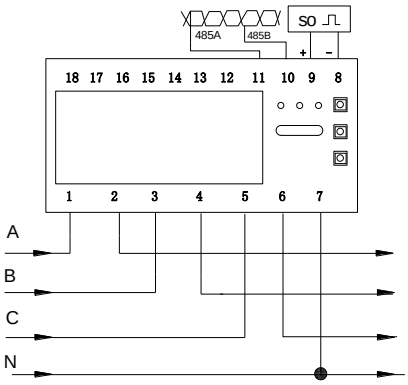
- Turn off all the power before working on it.
- Always use a properly rated voltage sensing device to confirm that power is off.

WARNING

- Installation should be performed by qualified personnel familiar with applicable codes and regulations.
- Use isolated tools to install the meter.
- Fuse or thermal cut-off or single-pole circuit breaker can't be fitted on the supply line and not the neutral line.

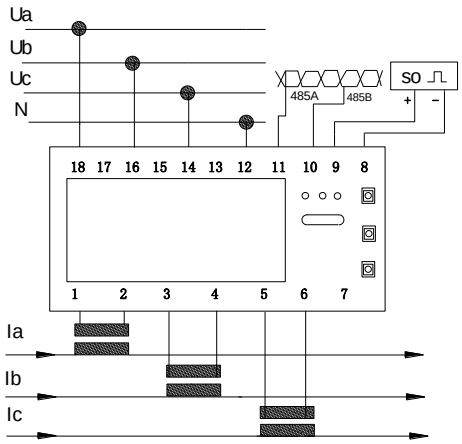
- We recommend that the connecting wire which is used to connect the meter to the outside circuit should be sized according to local codes and regulations for the amp city of the circuit breaker or over current device used in the circuit.
- An external switch or a circuit-breaker should be installed on the inlet wire, which will be used as a disconnection device for the meter. And there it is recommended that the switch or circuit-breaker is near the meter so that it is more convenience for the operator. The switch or circuit-breaker should comply with the specifications of the buildings electrical design and all local regulations.
- An external fuse or thermal cut-off which will be used as a over current protection device for the meter must be installed on the supply side wire, and it is recommended that the over current protection device is near the meter so that it is more convenience for the operator. The over current protection device should comply with the specifications of the buildings electrical design and all local regulations.
- This meter can be installed indoor directly, or in a meter box which is waterproof outdoor, subject to local codes and regulations.
- To prevent tampering, secure the meter with a padlock or a similar device.
- The meter has to be installed against a wall which is fire resistant.
- The meter has to be installed in a good ventilated and dry place.
- The meter has to be installed in a protection box when placed in dangerous or dusty environment.
- The meter can be installed and used after being tested and sealed with a letter press printing.
- The meter can be installed on a 35mm DIN rail or direct on a meter board with screws.
- The meter should be installed in an available height so that it is easy to read.
- When the meter is installed in an area with frequent surges due to e.q. thunderstorms, welding machines, inverters etc, protect the meter with Surge Protection Devices
- After finishing installation, the meter must be sealed to prevent tampering.
- Connection of the wires should be done in accordance with the underneath connection diagram.

A、Direct connect type:



1/2	Ia	IN/OUT
3/4	Ib	IN/OUT
5/6	Ic	IN/OUT
7	Neutral wire	
8/9	Test pulse output contact	
10/11	RS485 communication contact	

B、CT connect type

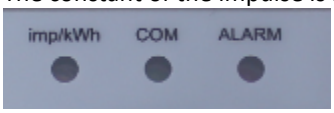


1/2	Ia	IN/OUT
3/4	Ib	IN/OUT
5/6	Ic	IN/OUT
18/16/14/12	Phase A/B/C/N	
8/ 9	Test pulse output contact	
10/11	RS485 communication contact	

1.11 Operating

Consumption indication

On the DRT710M'S front panel, there are three LEDs, which are indicators for energy pulse, communications, and Alarms. The constant of the impulse is shown on the nameplate of the meter.

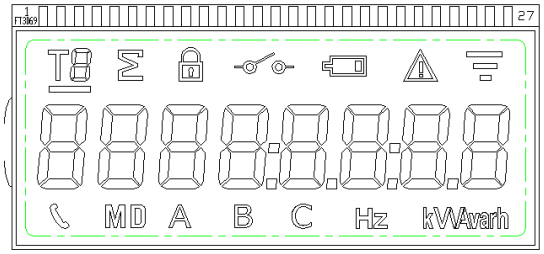


Reading the meter

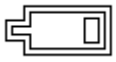
Electric meter in the city exist will automatically round of significant power and the rate of the current total power timeshare. Meter with three buttons on the nameplate, respectively, programming switches and flip up and down keys. Through the fluctuation in the scroll button to see total, sharp, peak, flat, valley power ;last month, total, sharp, peak, flat, and valley power ;the month before last ,total, sharp, peak, flat, valley power; demand quantity of total ,total sharp,total peak ,total flat ,total valley in current month; demand quantity of total ,total sharp,total peak ,total flat ,total valley in the last month ; demand quantity of total ,total sharp,total peak ,total flat ,total valley in the month before last take place.Three-phase voltage, three-phase current, active power and phase of total power, depending on the total phase power and apparent power, frequency, battery voltage, Date Time, pulse constant, table, and automatic meter reading date, etc.; 20 seconds automatically after the restoration of the current total power consumption display.

Municipal electric power will have an internal battery power supply, power meter display support.

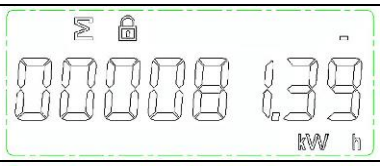
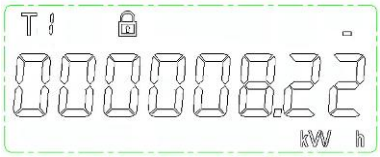
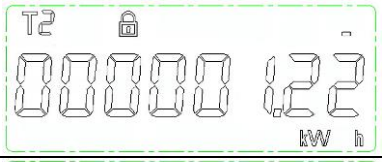
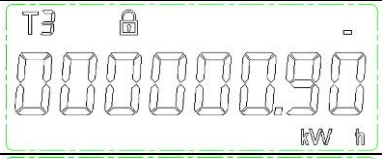
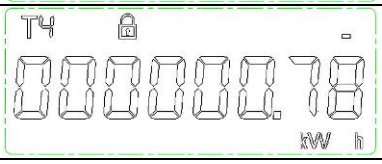
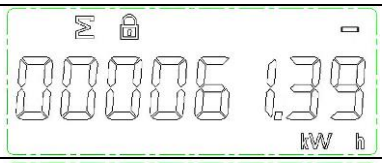
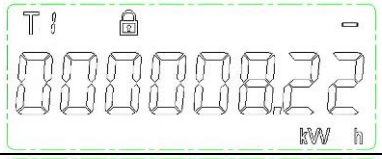
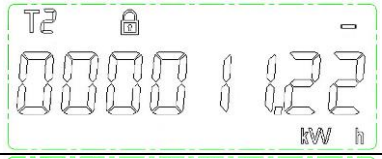
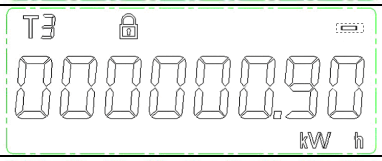
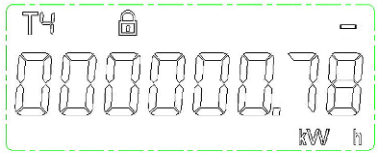
LCD CONTECT

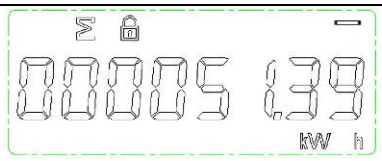
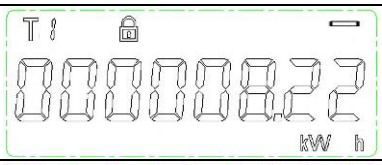
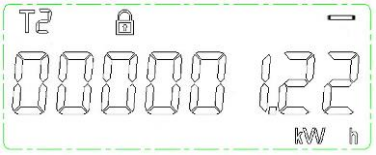
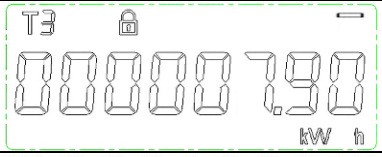
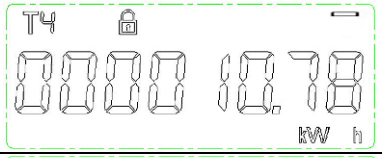
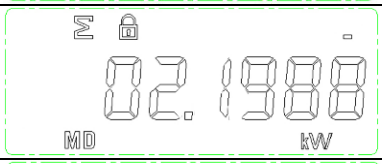
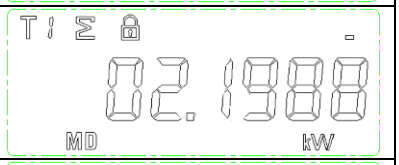
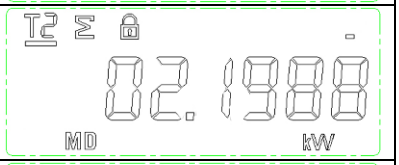
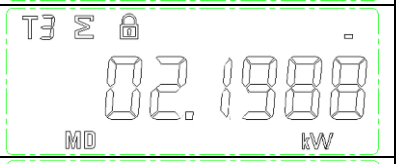
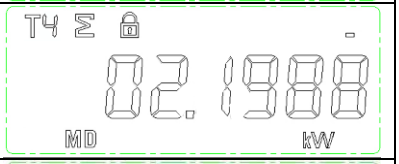
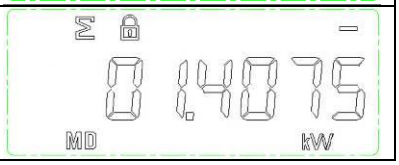


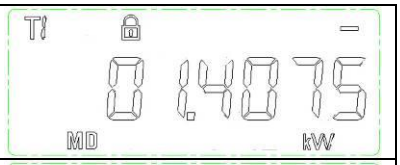
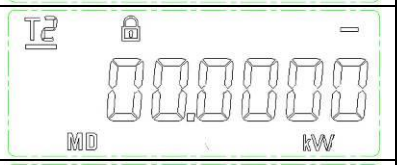
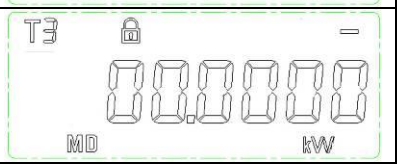
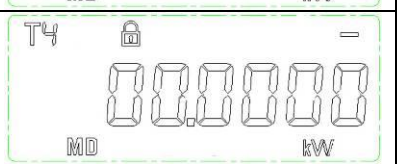
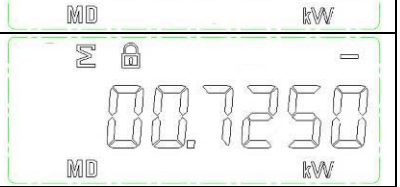
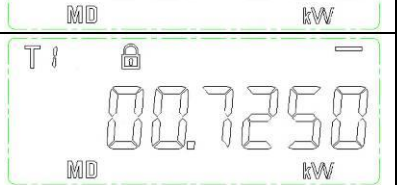
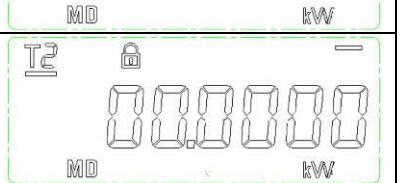
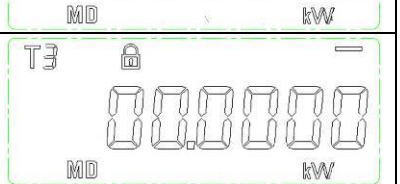
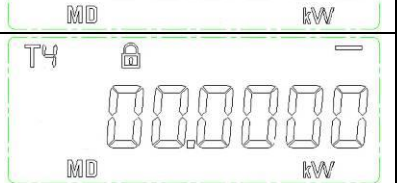
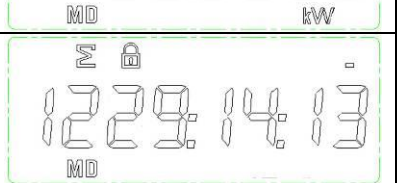
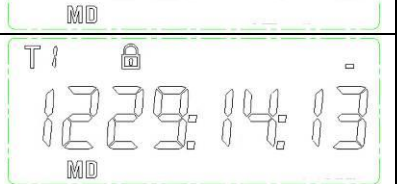
DESCRIPTION OF LCD SYMBOLS DISPLAYED

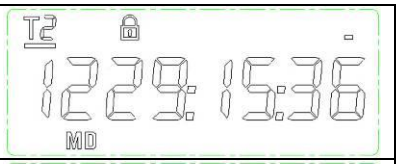
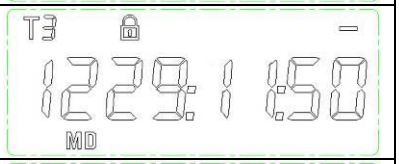
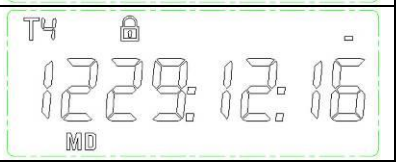
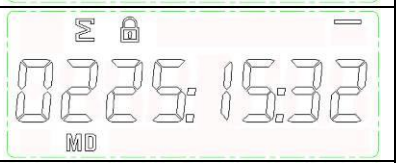
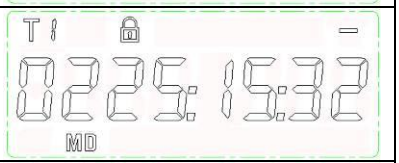
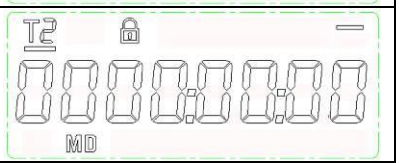
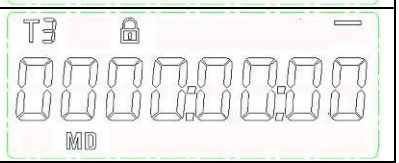
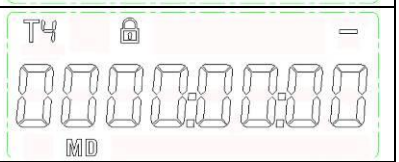
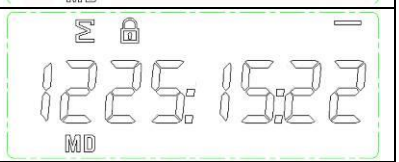
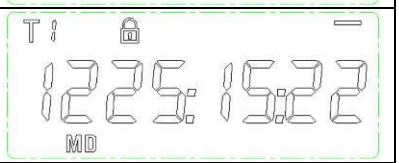
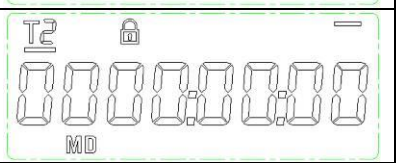
Symbol	Description
kW h	Unit indicator： kWh—active energy kW—active power
k var	Unit indicator ： kvar—reactive power
kvA	Unit indicator ： KVA — apparent energy
	Displayed: not allowed programming Disappear: allow programming
	Battery status:3.6V When the battery voltage is low, flashes show
	LCD alarm indicator
	Communication symbols（ When communicating,it flashed ）， For 485 and infrared communication interface in communication instructions
MD	Max demand
	Tariff: T1,T2,T3,T4
	this month last 1 month last 2 month

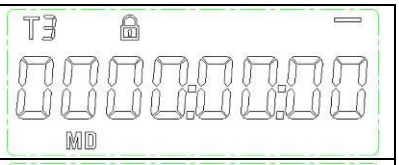
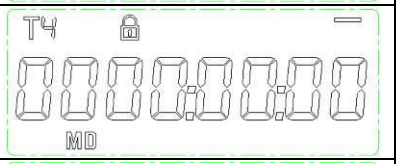
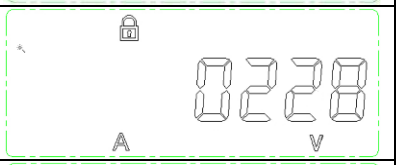
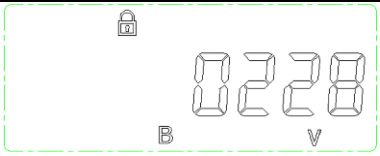
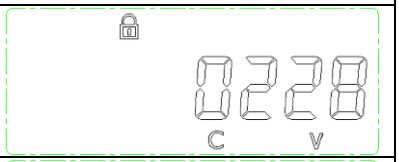
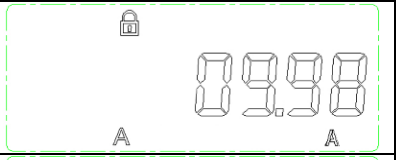
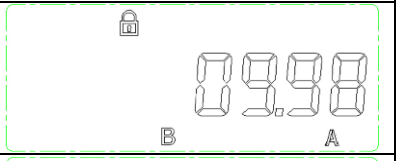
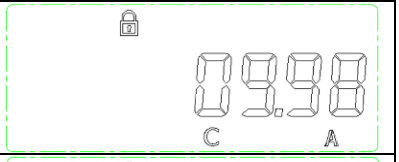
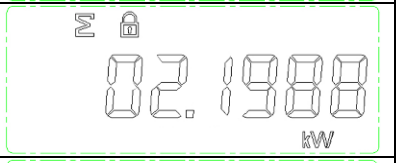
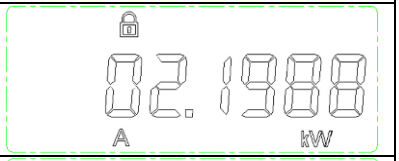
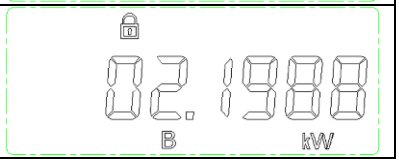
Display Content:

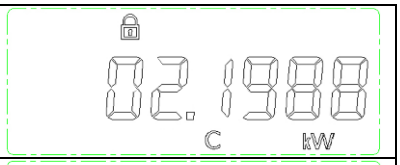
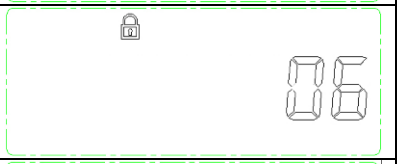
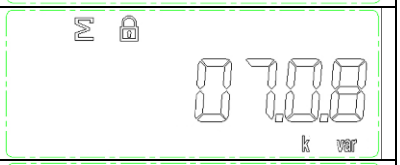
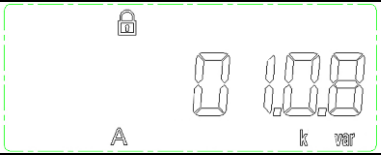
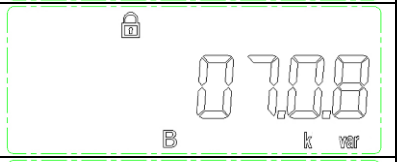
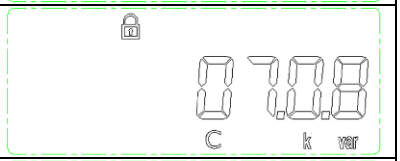
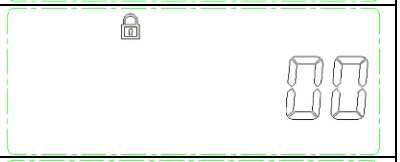
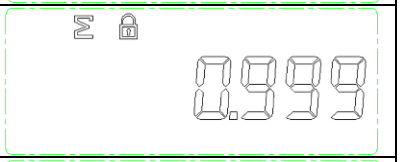
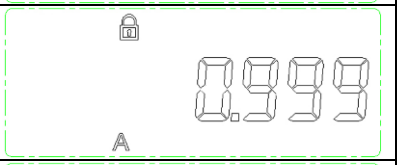
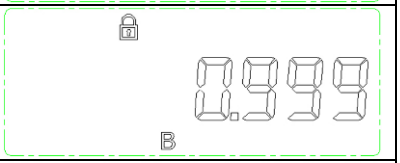
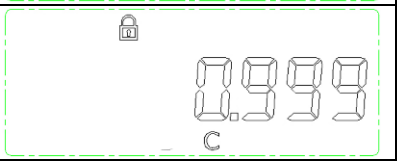
Item	Description	Format	HEX	LCD Display
1	Current Total Active Energy	xxxxxx.xx kWh	9010H	
2	Current Active Energy of Tariff 1	xxxxxx.xx kWh	9011H	
3	Current Active Energy of Tariff 2	xxxxxx.xx kWh	9012H	
4	Current Active Energy of Tariff 3	xxxxxx.xx kWh	9013H	
5	Current Active Energy of Tariff 4	xxxxxx.xx kWh	9014H	
6	total active energy of last month	xxxxxx.xx kWh	9410H	
7	active energy of Tariff one of last month	xxxxxx.xx kWh	9411H	
8	active energy of Tariff two of last month	xxxxxx.xx kWh	9412H	
9	active energy of Tariff three of last month	xxxxxx.xx kWh	9413H	
10	active energy of Tariff four of last month	xxxxxx.xx kWh	9414H	

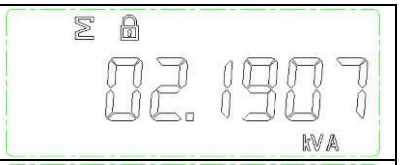
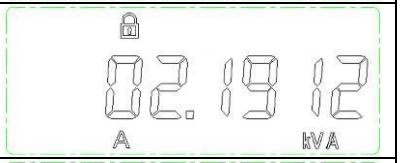
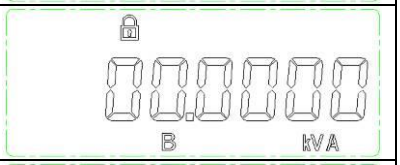
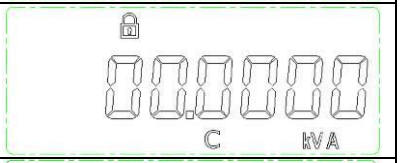
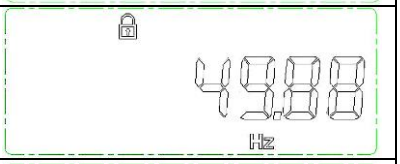
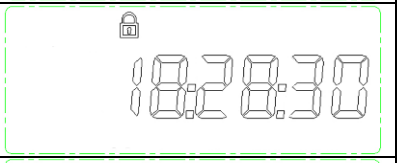
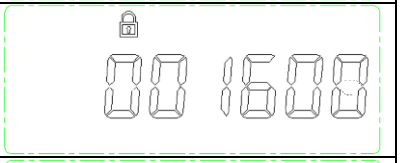
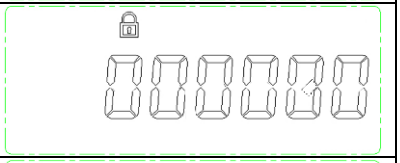
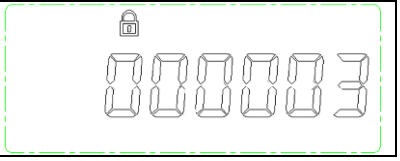
11	total active energy of last-last-month	xxxxxx.xx kWh	9810H	
12	total active energy of tariff one of last-last-month	xxxxxx.xx kWh	9811H	
13	total active energy of tariff two of last-last-month	xxxxxx.xx kWh	9812H	
14	total active energy of tariff three of last-last-month	xxxxxx.xx kWh	9813H	
15	total active energy of tariff four of last-last-month	xxxxxx.xx kWh	9814H	
16	Current Max demand for active power	xx.xxxx kW	A010H	
17	Current Max demand for active power of tariff 1	xx.xxxx Kw	A011H	
18	Current Max demand for active power of tariff 2	xx.xxxx kW	A012H	
19	Current Max demand for active power of tariff 3	xx.xxxx kW	A013H	
20	Current Max demand for active power of tariff 4	xx.xxxx kW	A014H	
21	Max demand for active power of last month	xx.xxxx kW	A410H	

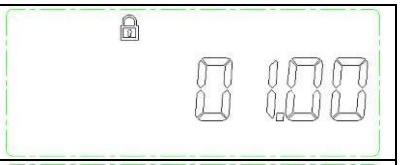
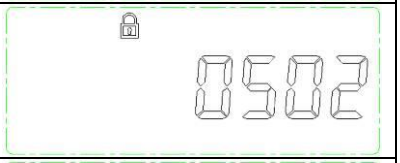
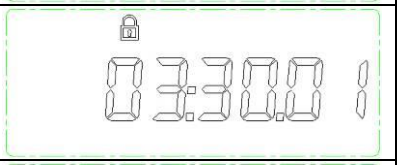
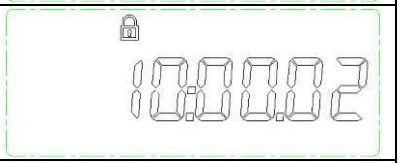
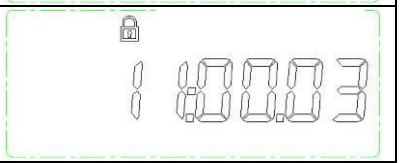
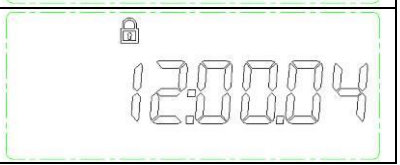
22	Max demand for active power of Tariff 1 of last month	xx.xxxx Kw	A411H	
23	Max demand for active power of Tariff 2 of last month	xx.xxxx kW	A412H	
24	Max demand for active power of Tariff 3 of last month	xx.xxxx kW	A413H	
25	Max demand for active power of Tariff 4 of last month	xx.xxxx kW	A414H	
26	Max demand for active power of last-last-month	xx.xxxx kW	A810H	
27	Max demand for active power of Tariff 1 of last-last- month	xx.xxxx Kw	A811H	
28	Max demand for active power of Tariff 2 of last-last- month	xx.xxxx kW	A812H	
29	Max demand for active power of Tariff 3 of last-last- month	xx.xxxx kW	A813H	
30	Max demand for active power of Tariff 4 of last-last- month	xx.xxxx kW	A814H	
31	Time of max. demand in current month	MMDD.HH:mm	B110H	
32	Time of max. demand of tariff 1 in current month	MMDD.HH:mm	B111H	

33	Time of max. demand of tariff 2 in current month	MMDD.HH:mm	B112H	
34	Time of max. demand of tariff 3 in current month	MMDD.HH:mm	B113H	
35	Time of max. demand of tariff 4 in current month	MMDD.HH:mm	B114H	
36	Time of max. demand in last month	MMDD.HH:mm	B410H	
37	Time of max. demand of tariff 1 in last month	MMDD.HH:mm	B411H	
38	Time of max. demand of tariff 2 in last month	MMDD.HH:mm	B412H	
39	Time of max. demand of tariff 3 in last month	MMDD.HH:mm	B413H	
40	Time of max. demand of tariff 4 in last month	MMDD.HH:mm	B414H	
41	Time of max. demand in last-last-month	MMDD.HH:mm	B810H	
42	Time of max. demand of tariff 1 in last-last-month	MMDD.HH:mm	B811H	
43	Time of max. demand of tariff 2 in last-last- month	MMDD.HH:mm	B812H	

44	Time of max. demand of tariff 3 in last-last- month	MMDD.HH:mm	B813H	
45	Time of max. demand of tariff 4 in last-last- month	MMDD.HH:mm	B814H	
46	Voltage of Phase A	XXXX V	B611H	
47	Voltage of Phase B	XXXXX V	B612H	
48	Voltage of Phase C	XXXX V	B613H	
49	Current of Phase A	XX. XX A	B621H	
50	Current of Phase B	XX. XX A	B622H	
51	Current of Phase C	XX. XX A	B623H	
52	Total active power	XX. XXXX kW	B630H	
53	Active power of phase A	XX. XXXX kW	B631H	
54	Active power of phase B	XX. XXXX kW	B632H	

55	Active power of phase C	XX. XXXX kW	B633H	
56	Polarity of active power	XX	B636H	
57	total reactive power	XX. XX kvar	B640H	
58	Reactive power of phase A	XX. XX kvar	B641H	
59	Reactive power of phase B	XX. XX kvar	B642H	
60	Reactive power of phase C	XX. XX kvar	B643H	
61	Polarity of reactive power	XX	B644H	
62	Total CosΦ	X.XXX	B650H	
63	cosΦ of phase A	X.XXX	B651H	
64	cosΦ of phase B	X.XXX	B652H	
65	cosΦ of phase C	X.XXX	B653H	

66	Total apparent power	XX. XXXX kVA	B660H	
67	apparent power of phase A	XX. XXXX kVA	B661H	
68	apparent power of phase B	XX. XXXX kVA	B662H	
69	apparent power of phase C	XX. XXXX kVA	B663H	
70	Frequency	XX.XX	B664H	
71	3.6V battery voltage	X.X V	B673H	
72	date	YYMM.DD	C010H	
73	time	Hh:mm:ss	C011H	
74	constant	NNNNNN imp/kWh	C030H	
75	Meter ID (High 6 digits)	NNNNNN	C032H	
76	Meter ID (Low 6 digits)	NNNNNN		

77	Automatic meter-reading date	DD.hh	C117H	
78	Current period and tariff			
79	Starting Time of period and tariff 1	HH:MM.NN	C331H	
80	Starting Time of period and tariff 2	HH:MM.NN	C332H	
81	Starting Time of period and tariff 3	HH:MM.NN	C333H	
82	Starting Time of period and tariff 4	HH:MM.NN	C334H	

Pulse output

DRT710M DIN rail power quality meter is equipped with a pulse output which is fully separated from the inside circuit. That generates pulses in proportion to the measured energy. They are test pulse output (terminals 8 & 9). Usually, the test pulse output is used as testing accuracy or reading purpose in close quarters.

The test pulse output is a polarity dependant, passive transistor output requiring an external voltage source for correct operation. For this external voltage source, the voltage (Ui) should be 5-27V DC, and the maximum input current (Imax) should be 27mA DC. To connect the impulse output, connect 5-27V DC to connector 9 (anode), and the signal wire (S) to connector 8 (cathode). The meter pulses is indicated on the front panel.

Communication port

DRT710M has equipped a far infrared port and a RS485 port, we can program the meter's operation data or reading via these 2 ports. The communication protocol conforms MODBUS RTU protocol.

All the technical setting is done through RS485 Modbus. When you need program the meter, make sure you have unlock the meter. This symbol shall not show on the LCD. The way to unlock the meter is pressing the PRG button. As for the Modbus Protocol information, please check the "Modbus Protocol for SDM"

The default setting of the meter is : **Address: 01**
Baudrate: 1200bps
Parity: EVEN
Databits: 8
Stop Bit: 1

Far infrared communication port

The far infrared communication port is on the left of LCD screen. It is infrared wireless communication port. The TP900 hand-held programmer can directly communicate the data between the meter and this port.
The data transmission speed is 1200bps(default).
The communication distance is not less than 5m.

Rs485 output

RS485 communication port is between the meter terminals 11 and 10.
It is a synchronization wire port. Installing a software in PC, via RS485 adapter
Connecting the terminal 11 and 10, PC can communicate with the meter immediately.

1.13 Troubleshooting

CAUTION
♦ During reparation and maintenance, do not touch the meters connecting clamps directly with your bare hands, with metal, blank wire or other material as you will have the chance of an electricity shock and a possible chance for health damage. ♦ Turn off and lock out all power supplying the energy meter and the equipment to which it is installed before opening the protection cover to prevent the hazard of an electric shock.

WARNING
♦ Maintenance or reparation should be performed by qualified personnel familiar with applicable codes and regulations. ♦ Use insulated tools to maintain or repair the meter. ♦ Make sure the protection cover is in place after maintenance or reparation.

Problem	Check	Solution
No light for the communication indicator(COM.LED)	Is there a power supply inside the meter?	Check that the power supply
	Does any equipment outside communicate with the meter	Only when the communication between the meter's infrared port Or the RS485 port and the equipment outside, The LED will blink
	Maybe there is a fault in the inside circuit.	Please contact your technical supporter to replace this meter.

Problem	Check	Solution
No communication Of RS485 wire data with the meter	Is the meter ID correct?	Check and use the correct the Meter ID. After the meter finish the production, the Meter ID defaults to 0～67H ,69H～FFH (Modbus protocol) or 0000000000000～999999999999(DL/T645 protocol) .
	Is the communication distance too long?	Shorten the communication distance between the reading equipment outside and the meter. Keep sure it is not more than 1200m
	Is there too many meters connected to RS485 main wire	The equipment to connection with RS485 main wire is not more than 256pcs
	Is the RS485 port connection correct? Is the connection	The correct connection is: the A signal wire of RS485 main wire to the meter terminal 11,the B signal wire of RS485 main wire to the meter terminal 10
	Maybe there is a fault in the inside circuit.	Please connect with technical supporter to replace this meter.
No communication of the infrared wireless data with the meter	Is the meter ID correct?	Check and use the correct the Meter ID. After the meter finish the production, the Meter ID defaults to 0～67H ,69H～FFH (Modbus protocol) or 0000000000000～999999999999(DL/T645 protocol)
	Is the communication distance too long?	Shorten the communication distance between the reading equipment outside and the meter. suggest not more than 5m
	Is the communication protocol correct?	Please contact the technical support to get the meter communication protocol
	Maybe there is a fault in the inside circuit.	Please contact the technical supporter to replace this meter.

Problem	Check	Solution
The LCD energy register can't run.	Is the load running ? Is the operating power too low ? Maybe there is a fault in the inside circuit.	Only when load is running, RED LED is burning continue, the LCD energy register will run. If the operating power is too low, the spacing interval of the pulses will take some more time. This is why it seems like the LCD energy register can't run Please contact your technical supporter to replace this meter.
No pulse output.	Is DC power supply connected to the meter ? Is the connecting correct ? Maybe there is a fault in the inside circuit.	Check the external voltage source (Ui) is 5-27V DC. Check correct connecting: Connect 5-27V DC to connector 3 (anode), and the signal wire (S) to connector 2 (cathode). Please contact your technical supporter to replace this meter.
Pulse output rate wrong.	Maybe there is a fault in the inside circuit.	Please connect with technical supporter to replace this meter.

DRT710M register Map

The following table describes the global register map for the function Codes 0X03(register read) and 0x10(register write) for DRT710M (Three phase DIN rail power quality meter with multi-tariff)

Address (hex)	Length (bytes)	Parameter Name	Access (R/W)	Data Format	Units
0x0010	4	Voltage L1	R	Hex	V
0x0012	4	Voltage L2	R	Hex	V
0x0014	4	Voltage L3	R	Hex	V
0X0030	4			Hex	
0x0032	4			Hex	
0x0034	4			Hex	
0X004E	4	Frequency	R	Hex	Hz
0X0050	4	Current L1	R	Hex	A
0X0052	4	Current L2	R	Hex	A
0X0054	4	Current L3	R	Hex	A
0X0056	4	Current Neutral	R	Hex	A
0x0090	4	Power L1	R	Hex	kW
0x0092	4	Power L2	R	Hex	kW
0x0094	4	Power L3	R	Hex	kW
0x0096	4	Power Total	R	Hex	kW
0x00D0	4	Apparent Power L1	R	Hex	kVA
0x00D2	4	Apparent Power L2	R	Hex	kVA
0x00D4	4	Apparent Power L3	R	Hex	kVA
0x00D6	4	Apparent Power Total	R	Hex	kVA
0x0110	4	Reactive Power L1	R	Hex	kvar

0x0112	4	Reactive Power L2	R	Hex	kvar
0x0114	4	Reactive Power L3	R	Hex	kvar
0x0116	4	Reactive Power Total	R	Hex	kvar
0x0150	4	Power Factor L1	R	Hex	
0x0152	4	Power Factor L2	R	Hex	
0x0154	4	Power Factor L3	R	Hex	
0x0156	4	Power Factor Total	R	Hex	
0x0160	4	Import Energy	R	Hex	KWh
0x0166	4	Export Energy	R	Hex	KWh
0x07D0	4	Import Energy Rate 1	R	Hex	KWh
0x07D2	4	Import Energy Rate 2	R	Hex	KWh
0x07D4	4	Import Energy Rate 3	R	Hex	KWh
0x07D6	4	Import Energy Rate 4	R	Hex	KWh
0x08D0	4	Export Energy Rate 1	R	Hex	KWh
0x08D2	4	Export Energy Rate 2	R	Hex	KWh
0x08D4	4	Export Energy Rate 3	R	Hex	KWh
0x08D6	4	Export Energy Rate 4	R	Hex	KWh
0XF000	4	Time	R/W	BCD	s--min--hour--week. Date—Month—Year--**20**

0XF111	20	Last 1 month positive Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF121	20	Last 2 month positive Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF131	20	Last 3 month positive Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF141	20	Last 4 month positive Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF151	20	Last 5 month positive Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF161	20	Last 6 month positive Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF171	20	Last 7 month positive Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF181	20	Last 8 month	R	Hex	kWh

		positive Energy (Total、Rate1、Rate2、Rate3、Rate4			
0XF191	20	Last 9 month positive Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF1A1	20	Last 10 month positive Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF1B1	20	Last 11 month positive Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF1C1	20	Last 12 month positive Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF211	20	Last 1 month reverse Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF221	20	Last 2 month reverse Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF231	20	Last 3 month	R	Hex	kWh

		reverse Energy (Total、Rate1、Rate2、Rate3、Rate4			
0XF241	20	Last 4 month reverse Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF251	20	Last 5 month reverse Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF261	20	Last 6 month reverse Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF271	20	Last 7 month reverse Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF281	20	Last 8 month reverse Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF291	20	Last 9 month reverse Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF2A1	20	Last 10 month reverse Energy	R	Hex	kWh

		(Total、Rate1、Rate2、Rate3、Rate4			
0XF2B1	20	Last 11 month reverse Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF2C1	20	Last 12 month reverse Energy (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kWh
0XF311	20	Last 1 month positive max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF321	20	Last 2 month positive max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF331	20	Last 3 month positive max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF341	20	Last 4 month positive max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF351	20	Last 5 month positive max	R	Hex	kW

		Demand (Total、Rate1、Rate2、Rate3、Rate4			
0XF361	20	Last 6 month positive max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF371	20	Last 7 month positive max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF381	20	Last 8 month positive max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF391	20	Last 9 month positive max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF3A1	20	Last 10 month positive max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF3B1	20	Last 11 month positive max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF3C1	20	Last 12 month positive max Demand (Total、	R	Hex	kW

		Rate1、Rate2、Rate3、Rate4			
0XF411	20	Last 1 month reverse max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF421	20	Last 2 month reverse max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF431	20	Last 3 month reverse max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF441	20	Last 4 month reverse max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF451	20	Last 5 month reverse max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF461	20	Last 6 month reverse max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF471	20	Last 7 month reverse max Demand (Total、	R	Hex	kW

		Rate1、Rate2、Rate3、Rate4			
0XF481	20	Last 8 month reverse max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF491	20	Last 9 month reverse max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF4A1	20	Last 10 month reverse max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF4B1	20	Last 11 month reverse max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF4C1	20	Last 12 month reverse max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XF500	4	Demand interval、slide time、Display time、Display interval	R/W	BCD	min-min-s-s
0XF600	4			Hex	

0XF700	0F	Tariff	R/W	BCD	Tariff number-Min-Hour
0XF800	2	Baud rate	W	Hex	0001H:1200bps 0002H:2400bps 0003H:4800bps 0002H:9600bps
0XFA01	0A	Current month positive max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW
0XFB01	0A	Current month reverse max Demand (Total、Rate1、Rate2、Rate3、Rate4	R	Hex	kW

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